

EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

PUBLICATION NUMBER : 10286202
PUBLICATION DATE : 27-10-98

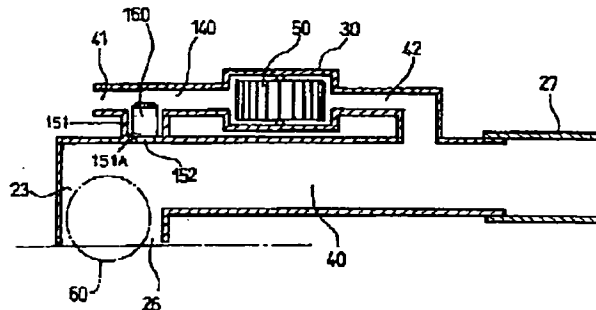
APPLICATION DATE : 15-04-97
APPLICATION NUMBER : '09096857

APPLICANT : TEC CORP;

INVENTOR : MORISHITA ATSUSHI;

INT.CL. : A47L 9/04

TITLE : SUCTION PORT BODY OF VACUUM
CLEANER



ABSTRACT : PROBLEM TO BE SOLVED: To provided a suction port body of a vacuum cleaner in which a blocking member does not come up from a housing chamber to block on intake during cleaning even if the blocking member is made lightweight.

SOLUTION: The suction port body of vacuum cleaner has a rotating cleaning body 60 provided freely rotatably in a rotating cleaning body chamber 23, a turbine chamber 30 having an intake, a turbine 50 arranged in this turbine chamber 30, a housing chamber 151 the upper part of which is opened, a blocking member 160 housed in the housing chamber 151 and a suction duct 40 communicating a suction port 26 and a rotating tube 27. In this case, a slit 152 is formed in the bottom wall 151A of the housing chamber 151, which is communicating with the rotating cleaning body chamber 23 or the suction duct 40.

COPYRIGHT: (C)1998,JPO

* NOTICES *

JP0 and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the inlet port body of the vacuum cleaner made to rotate a rotational cleaning body on the torque of a turbine.

[0002]

[Description of the Prior Art]From the former, what is shown in drawing 10 thru/or drawing 12 is known as an inlet port body of the vacuum cleaner made to rotate a rotational cleaning body on the torque of a turbine.

[0003]In drawing 10 thru/or drawing 12, 1 is a suction opening main body and in this suction opening main body 1 The turbine room 2, The turbine 3 formed in this turbine room 2 enabling free rotation, the rotational cleaning bodies 4 and 5 rotated by rotation of the turbine 3, and the inverter 6 for slowing down revolving speed on a peach and making it transmit to the rotational cleaning bodies 4 and 5, when the hand of cut of the turbine 3 is changed are formed.

[0004]In the suction opening main body 1, section forming of the rotational cleaning body rooms 7 and 8 is carried out, they face these rotational cleaning body rooms 7 and 8 the intake openings 9 and 10, and the rotational cleaning bodies 4 and 5 are formed, enabling free rotation.

The gears 4A and 5A are attached to the axis (not shown) of the rotational cleaning bodies 4 and 5. It is connected to the output shafts 6A and 6A of the inverter 6 via the timing belt T1 and T2, and the rotational cleaning bodies 4 and 5 rotate the gears 4A and 5A via the timing belt T1, T2, and the gears 4A and 5A by rotation of the output shafts 6A and 6A.

[0005]The input shaft 6B of the inverter 6 and the axis of rotation 3A of the turbine 3 are connected via timing-belt T3, If the turbine 3 rotates, the input shaft 6B of the inverter 6 will rotate via timing-belt T3, the output shafts 6A and 6A rotate by rotation of this input shaft 6B, and the rotational cleaning bodies 4 and 5 rotate via the timing belt T1 and T2.

[0006]In the suction opening main body 1, the guidance air course 13 which shows the open air to the turbine room 2, the sucking air duct 16 for attracting the dust through which its hand was run by the rotational cleaning body, and the exhaust wind way 17 which shows the open air passing through the turbine room 2 to

the sucking air duct 16 are formed. This exhaust wind way 17 and turbine room 2 are opened for free passage by the communicating hole Ka established in the partitioning wall K. While the sucking air duct 16 is open for free passage with the rotational cleaning body rooms 7 and 8, the cleaner body which is not illustrated via the extension wands (not shown) etc. which are connected to the communication trunk S is open for free passage, and the sucking air duct 16 is made into negative pressure.

[0007]With this negative pressure, the open air is inhaled to the turbine room 2 via the stoma 19a and the guidance air course 13 which were established in the upper case 19, and when this open air flows into the sucking air duct 16 via the exhaust wind way 17, the turbine 3 rotates.

[0008]The storage room 14 which extended caudad is formed in the bottom wall 13A of the guidance air course 13, and this storage room 14 and the exhaust wind way 17 are opened for free passage by the communicating path 18.

The metal blocking members 15 by which the lower part was formed in sphere form are stored by the storage room 14.

[0009]The key map showing the relation of these guidance air course 13, the exhaust wind way 17, the sucking air duct 16, and the communicating path 18 is shown in drawing 13.

[0010]The blocking member 15 blockades the communicating path 18, when the suction opening main body 1 turns over and is not carried out, and when the suction opening main body 1 turns over and is carried out, the blocking member 15 blockades the guidance air course 13, and it stops rotation of the turbine 3.

[0011]When the blocking member 15 blockades the guidance air course 13, the storage room 14 and the exhaust wind way 17 are open for free passage, and the dust which entered into the pars basilaris ossis occipitalis of the storage room 14 is attracted. This prevents dust from the storage room 14 being covered, and it is made to ensure the operation of the blocking member 15.

[0012]

[Problem(s) to be Solved by the Invention]By the way, if it was in such an inlet port body, when not having turned the anticipated-use state 1, i.e., a suction opening main body, over, there was a problem that the blocking member 15 lost touch with the storage room 14 easily, blockaded the guidance air course 13, and rotation of the turbine 3 was not fully obtained. As this shows drawing 13, since the communicating path 18 is always open for free passage to the atmosphere and the guidance air course 13 open for free passage, and a degree of vacuum does not become not much high, it originates also in the power of attracting the blocking member 15 being weak.

[0013]this invention is made in view of the above-mentioned problem, and comes out. The purpose is to provide the inlet port body of the vacuum cleaner which ** loses touch with a storage room during cleaning, and does not blockade a guidance air course.

[0014]

[Means for Solving the Problem]A rotational cleaning body provided in a rotational cleaning body room which

has the intake opening formed in the bottom of a suction opening main body according to the invention of claim 1 enabling free rotation, A turbine room which was open for free passage via a guidance air course in the open air, and was established in said suction opening main body, A turbine which is formed in this turbine room, enabling free rotation, rotates by the open air from said guidance air course, and is made to rotate said rotational cleaning body, A storage room provided in said suction opening main body so that the opening of the upper part might be carried out and this opening might face said guidance air course, A blocking member which projects from said opening and blockades said guidance air course when it was stored by this storage room, and said suction opening main body turns over and is carried out, It is an inlet port body of a vacuum cleaner provided with a communication trunk formed in said suction opening main body, and a sucking air duct which is formed in said suction opening main body, and opens said intake opening and a communication trunk for free passage, Said storage room was formed on a sucking air duct, a hole was established in a pars basilaris ossis occipitalis of this storage room, and this storage room and said sucking air duct were made to open for free passage.

[0015]An invention of claim 2 constituted said hole from a porous member.

[0016]An invention of claim 3 made a bottom wall of said storage room the shape of flatness, and made the bottom of said blocking member a flat surface.

[0017]A rotational cleaning body provided in a rotational cleaning body room where an invention of claim 4 has the intake opening formed in the bottom of a suction opening main body enabling free rotation, A turbine room which was open for free passage via a guidance air course in the open air, and was established in said suction opening main body, A turbine which is formed in this turbine room, enabling free rotation, rotates by the open air from said guidance air course, and is made to rotate said rotational cleaning body, A storage room provided in said suction opening main body so that the opening of the upper part might be carried out and this opening might face said guidance air course, It is stored by this storage room and has a blocking member which projects from said opening and blockades said guidance air course when said suction opening main body turns over and is carried out, Said blocking member is an inlet port body of a vacuum cleaner which has a columnar part and the taper part formed on this columnar part, It formed with a ringed wall which prevents the open air inhaled to said guidance air course from hitting the side of said blocking member in said storage room, and it is more than a columnar part of said blocking member, and height of said ringed wall was set below to the topmost part of said taper part.

[0018]According to the invention of claim 5, height of said ringed wall was set up so that a projection amount of a blocking member at the time of said suction opening main body turning over, and being carried out might become smaller than height of this blocking member.

[0019]

[Embodiment of the Invention]Hereafter, the embodiment of the inlet port body of the vacuum cleaner concerning this invention is described based on a drawing.

[0020]In drawing 1 thru/or drawing 5, 20 is an inlet port body of a vacuum cleaner, and this inlet port body 20 is provided with the suction opening main body 21, and in this suction opening main body 21, The turbine

room 30 and the turbine 50 arranged enabling the free rotation to the turbine room 30, The rotational cleaning body (agitator) 60 rotated by rotation of the turbine 50 and the inverter 70 grade for slowing down revolving speed on a peach and making it transmit to the rotational cleaning body 60, when the hand of cut of the turbine 50 is changed are provided. The suction opening main body 21 has the upper case 211 and the lower case 212.

[0021]In the suction opening main body 21, section forming of the oblong rotational cleaning body room 23 is carried out with the partitioning wall 24, and the rotational cleaning body room 23 has the intake opening 26 provided in the bottom 21A of the suction opening main body 21. The intake opening 26 is faced the rotational cleaning body room 23, the rotational cleaning body 60 is formed in it, enabling free rotation, and the gear 62 is attached to the axis (not shown) of the rotational cleaning body 60.

[0022]The gear 62 is connected with the output gear 71 of the inverter 70 via the timing belt 73, and the rotational cleaning body 60 rotates it via the timing belt 73 and the gear 62 by rotation of the output gear 71.

[0023]The inverter 70 is provided with the following.

The device main frame 75 which contained the bevel gears 70A and 70B etc. as shown in drawing 6.

The input shaft 76 caudad projected from the lower part of this device main frame 75.

This inverter 70 is slowed down while it changes rotation of the circumference of the vertical axis of the input shaft 76 into rotation of the circumference of a horizontal axis, and it is outputted to the output shaft 71.

[0024]The gear 78 is attached to the input shaft 76, and this gear 78 and the gear 58 attached to the axis of rotation 51 of the turbine 50 are connected with it via the timing belt 74.

[0025]The guidance air course 41 which shows the open air introduced in the suction opening main body 21 from the stoma 213 of a large number provided in the upper case 211 to the turbine room 30, Section forming of the sucking wind way 40 formed under the turbine room 30 and the exhaust wind way 42 which makes the sucking wind way 40 open the open air passing through the turbine room 30 for free passage is carried out. The sucking wind way 40 is open for free passage to the rotary tube 27 attached to the rear of the suction opening main body 21, and the rotational cleaning body room 23 is open for free passage to the rotary tube 27 via the sucking wind way 40. And a sucking air duct comprises the rotational cleaning body room 23 and the sucking wind way 40.

[0026]The rotary tube 27 has become rotatable in the arrow P1 direction to the suction opening main body 11, and the communication trunk 28 is attached to the rotary tube 27. This communication trunk 28 connects the extension wands etc. which are not illustrated, is opened for free passage by the settling chamber of the main part of a vacuum cleaner (not shown) via a hose, and the sucking wind way 40 becomes negative pressure.

[0027]Section forming of the turbine room 30 is carried out with the disc-like partitioning wall 110 and the upper case 211 which were attached to the above-mentioned lower case 212, The tubular partitioning wall 111 which carried out section forming of the exhaust wind way 42 is formed in the undersurface of the partitioning wall 110, and the open end 111A of this partitioning wall 111 has attended the opening 27A of the rotary tube 27. The communicating hole 112 which opened the turbine room 30 and the exhaust wind

way 42 for free passage is established in the partitioning wall 110.

[0028]The guidance air course 41 comprises the annular air course part 41A provided in accordance with the circumference of the turbine room 30, and the introductory air course part 41B formed in the downward position of the stoma 213 of the upper case 211. The annular air course part 41A is formed from the bottom wall part 120 by which continuously forming was carried out in accordance with the circumference of the partitioning wall 110, the side wall part 121 by which continuously forming was carried out to the peripheral wall of this bottom wall part 120, and the ringed wall 222 grade which was formed in the upper case 211 and joined to the upper bed part of the side wall part 121.

[0029]The introductory air course part 41B is formed from the bottom wall part 123 formed in the position which fell by one step from the bottom wall part 120, the side wall part 124 by which continuously forming was carried out to the bottom wall part 123 succeeding the side wall part 121, and the pendent wall part 223 grade which was formed in the upper case 211 and joined to the side wall part 124. The side wall part 124 and the pendent wall part 223 constitute some partitioning walls 24 which carried out section forming of the rotational cleaning body room 23. The introductory air course part 41B and the sucking wind way 40 are divided by the bottom wall part 123 and the septum 215 grade formed in the lower case 212.

[0030]And it is the inlet port 140 for the boundary neighborhood of the annular air course part 41A and the introductory air course part 41B to incorporate the open air into the turbine room 30, and this inlet port 140 is formed of the bottom wall part 120, the peripheral wall part 121, and the annular wall 222 grade.

[0031]The circular side attachment wall (ringed wall) 150 is formed in the bottom wall part 123, and section forming of the storage room 151 in which the upper part carried out the opening with this side attachment wall 150 is carried out to it. The pars basilaris ossis occipitalis 151A of the storage room 151 has become flatness-like, as the intake opening 26 is faced this pars basilaris ossis occipitalis 151A, two or more slit holes 152 are formed, and the storage room 151 and the sucking wind way 40 are open for free passage by this slit hole 152. The relation of the communicating state of each air courses 40-42 is notionally shown in drawing 7.

[0032]The cylindrical blocking member 160 is stored by the storage room 151, and when the inlet port body 20 turns over and is carried out, the blocking member 160 projects from the opening 151B of the storage room 151, and blockades the inlet port 140. The height of the side attachment wall 150 is set up so that the projection amount L of the blocking member 160 at this time (refer to drawing 9) may become smaller than height H of the blocking member 160.

[0033]The taper 161,162 is formed in it so that a path may become small, as it goes to the vertical section of the blocking member 160 up and down, and height H of the blocking member 160 is set to it so that taper 161 portion may project from the peripheral wall 150. The upper and lower sides 163,164 of the blocking member 160 are a flat surface, and when the inlet port body 20 turns over and is not carried out, the undersurface 163 of the blocking member 160 blockades the slit hole 152.

[0034]Next, operation of the above-mentioned inlet port body is explained.

[0035]First, the main part of a vacuum cleaner which is not illustrated is operated, the cleaning face H top is

moved for the inlet port body 10, and the cleaning face M is cleaned. Under the present circumstances, it will be in the state where the intake opening 26 of the bottom 21A of the suction opening main body 21 is blockaded by the cleaning face M.

[0036]A settling chamber becomes negative pressure by the operation of the main part of a vacuum cleaner, and the sucking wind way 40 serves as negative pressure via a hose, extension wands, a communication trunk, etc. With this negative pressure, it inhales from the intake opening 26 of the rotational cleaning body room 23, and air flows in the direction of an arrow (refer to drawing 5). By this, the dust of the cleaning face M, etc. will be attracted to the rotary tube 27.

[0037]Since the sucking wind way 40 is open for free passage to the turbine room 30, the open air is introduced from the stoma 213 of the upper case 211B to the introductory air course part 41B of the guidance air course 41, and is further inhaled to the turbine room 30 via the inlet port 140 and the annular air course part 41A. And the open air inhaled to the turbine room 30 is further inhaled via the exhaust wind way 42 on the sucking wind way 40, and the turbine 50 will carry out the high velocity revolution by this.

[0038]If the turbine 50 rotates, the input shaft 76 of the inverter 70 rotates via the gear 58 and the timing belt 74, and, thereby, the output gear 71 of the inverter 70 rotates. Its hand is run through its dust which the rotational cleaning body 60 rotated via the timing belt 73 and the gear 62, and adhered to the carpet etc. by rotation of the output gear 71. The rotational cleaning body 60 rotates to the clockwise rotation (setting to drawing 4).

[0039]In this state, as the blocking member 160 is shown in drawing 6 thru/or drawing 8, it is stored by the storage room 151 and the undersurface 163 of the blocking member 160 blockades the slit hole 152. Since the slit hole 152 is directly open for free passage on the sucking wind way 40, the blocking member 160 is attracted below with the negative pressure of the sucking wind way 40. That is, since the degree of vacuum of the sucking wind way 40 becomes high when the intake opening 26 is blockaded by the cleaning face M, the blocking member 160 which attends this sucking wind way 40 and is arranged is attracted. For this reason, it is prevented that the blocking member 160 comes floating by the open air F inhaled to the turbine room 30 even if weight is light, and projects from the storage room 151.

[0040]Since the blocking member 160 receives the power to a lower part by the open air F when the upper part serves as the taper 161, it cannot come floating easily. For this reason, weight of the blocking member 160 can be made still lighter. Since the open air F does not hit the side of the direct blocking member 160 by being in the state where the blocking member 160 is covered with the side attachment wall 150, the blocking member 160 is prevented from inclining or being unsteady by the open air F.

[0041]By the way, since the pars basilaris ossis occipitalis 151A of the storage room 151 has become flatness-like and the undersurface 164 of the blocking member 160 is a flat surface, The open air which was certainly blockaded by the blocking member 160 and was introduced to the introductory air course part 41B is certainly prevented from flowing through the slit hole 152 into the sucking wind way 40 via the slit hole 152.

[0042]Since it is the slit hole 152, the big garbage attracted on the sucking wind way 40 is prevented from

entering to the storage room 151. Since the pars basilaris ossis occipitalis 151A has become flatness-like (i.e., since the pars basilaris ossis occipitalis 151A is not in the state where it projected in the shape of heights to the sucking air duct 40), the garbage attracted on the sucking wind way 40 cannot enter easily for passing slit hole 152.

[0043]If the inlet port body 20 is turned over, by opening the intake opening 26 wide, the degree of vacuum of the sucking wind way 40 will fall, and the degree of vacuum of the turbine room 30 will become higher than the sucking wind way 40. For this reason, as shown in drawing 9, prudence is also added, and the blocking member 160 is projected from the opening 152 of the storage room 151, and blockades the inlet port 140. That is, the guidance air course 41 is blockaded. The open air is not inhaled by this blockade in the turbine room 30, for this reason, the revolving speed of the turbine 50 falls rapidly, and the turbine 50 stops. It is easy to take the thread kudzu twining round the rotational cleaning body 60 by stop of the turbine 50.

[0044]On the other hand, since the storage room 151 and the sucking wind way 40 are open for free passage by the slit hole 152, the open air flows in the direction shown according to arrow F1, and dust is prevented from collecting in the storage room 150.

[0045]By the way, when the inlet port body 20 is turned over, the blocking member 160 can prevent generating of an allophone, when this slack attains the weight saving of the blocking member 160 directly to the upper case 211. For this reason, it is not necessary to provide buffer members, such as rubber, in the upper surface of the blocking member 160 for prevention of generating of an allophone. Since the projection amount L of the blocking member 160 set up the height of the side attachment wall 150 become smaller than height H of the blocking member 160, when the inlet port body 20 is turned over, the blocking member 160 is prevented from escaping from and coming out from the storage room 151.

[0046]Since the blocking member 160 is cylindrical, there is no directivity in the case of attachment, and it is [it attaches and] easy to carry out at it.

[0047]Although two or more slit holes 152 are established in the pars basilaris ossis occipitalis 151A of the storage room 151 and being changed into the state where the pars basilaris ossis occipitalis 151A was constituted from a porous member, in the above-mentioned embodiment, Many small stomata may be provided, and a big hole may be provided, and, of course, a filter (porous member) may be attached to this hole.

[0048]

[Effect of the Invention]Since according to the invention of claim 1 the hole was established in the pars basilaris ossis occipitalis of the storage room and this storage room and sucking air duct were made to open for free passage as explained above, Even if it attains the weight saving of a blocking member, a blocking member loses touch with a storage room during cleaning, a guidance air course is not blockaded, for this reason, sufficient air capacity for a turbine acts during cleaning, and the torque of a rotational cleaning body is also fully acquired.

[0049]According to the invention of claim 2, since the hole established in the pars basilaris ossis occipitalis of the storage room was constituted from a porous member, the big garbage attracted on the sucking wind way

is prevented from entering to a storage room.

[0050]the storage room from the hole which the garbage attracted on the sucking wind way established in the bottom wall since the bottom wall of the storage room had become flatness-like according to the invention of claim 3 -- being alike -- it is hard to enter.

[0051]With the ringed wall which prevents the open air inhaled to a guidance air course from being equivalent to the side of a blocking member according to the invention of claim 4, form a storage room and by **. Even if it carries out the weight saving of the blocking member, while being able to prevent a blocking member from inclining or being unsteady by the open air, it comes out to prevent a blocking member from coming floating. Since it is more than the columnar part of a blocking member, the height of the ringed wall was set below to the topmost part of a taper part and a blocking member receives the power to a lower part by the open air, the weight saving of a blocking member can be attained further.

[0052]According to the invention of claim 5, since the height of the ringed wall was set up so that the projection amount of the blocking member at the time of a suction opening main body turning over and being carried out might become smaller than the height of this blocking member, a blocking member is prevented from escaping from and coming out from a storage room when a suction opening main body is turned over.

[Translation done.]